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a geologist if some one had to be sent in from elsewhere to do the work under his very nose?

And if the professor should protest, what answer would he get? That the assistants sent to do the work are competent men; that the national survey is authorized to enter every part of the national domain; that the state institutions have not the money to do the work with; that the assistants of the survey must do something to earn their salaries. And these things are all true enough, though the total results are none the less unfortunate and none the less fatal to an interest in geology among the people. For if the national survey can thus, under cover of national authority, injure the professional reputation of the professor of geology in one university, it can do it for any professor in any college or university in this country, and we have no redress.

Against all this sort of thing I not only enter my most vigorous protest, but I can not allow my name to stand on the roll of an organization so thoroughly undemocratic, and so thoroughly out of sympathy with the local interests of the country. In my opinion a public bureau administered in the spirit that has grown up in this one ought to have no place in a republic where it is important that there should be a widespread interest in science, and above all a feeling of safety for every worker, however humble.

Finally I beg to remind you that the question here at issue is not a question of geology, but a question of the administration of a public bureau.

I remain

Yours respectfully,

J. C. BRANNER.

#### THE PRESIDENCY OF THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY.

ANNOUNCEMENT has been made that the executive committee of the corporation of the Massachusetts Institute of Technology has selected Dr. Andrew Fleming West, professor in Latin in Princeton University, for the vacant presidency. It is ungracious to question an appointment of this character, and nothing could be gained by criticism if it were not that the corporation has not yet acted and Professor West has not yet accepted.

Professor West possesses many of the qualities that should be found in a college president. He was not elected to succeed President Patton at Princeton, but he would have been

an excellent president for an institution, which more than any other of our universities or semi-universities has been imbued with his ideals. These may be illustrated by a quotation from Professor West's most recent address. He writes: "And so I return to the opening thought: The old college ideal is the true one." The opening thought was "The living root of the old faculty, as of every other part of the college, was a distinctively Christian impulse \* \* \* the old college faculty at least professed and tried to show that God is the end of all our knowing and that Christ is the Master of the Schools."

But it is a long way from the chair of Latin in a classical and monastic college to the presidency of the Massachusetts Institute of Technology. It is to be feared that the trustees who favor the election of Professor West have been influenced by two factors. He is said to be known at Princeton as 'three-million-dollar West,' in view of his part in securing endowment for the institution, and he is known in the educational world as an opponent of President Eliot and the Harvard system. The writer once heard Professor West read a paper in which he said that the connection of the elective system and the three-year course at Harvard University was perhaps not accidental, as three years were enough of that sort of thing. But it is dangerous to cross swords with President Eliot, who replied that he had also noticed the connection between the elective system and the three-year course, but that he interpreted it as meaning that under the elective system a student could accomplish as much in three years as he could in four under the fixed curriculum.

It would seem to an outsider that in the present emergency the Massachusetts Institute of Technology needs for its president one of its own men, imbued with its methods and traditions, a man bred to science, believing in science as the chief factor in culture and in life, knowing that pure and applied science must go forward hand in hand, a man who would ally the institution with the city and the state rather than try to coax money from millionaires.

The corporation of the institute has recently met a disastrous defeat in its attempt to form a merger with Harvard University against the wishes of the faculty and alumni. Should it be so ill-advised as to elect a president without consultation with the faculty, it is to be hoped that Professor West will not accept until he assures himself of their approval. It is indeed quite possible that the election will be welcomed by the faculty, and that they will obtain a president beyond reproach—in which case science will have captured a captain from the enemy's camp.

J. McKEEN CATTELL.

#### SPECIAL ARTICLES.

##### A SIMPLE METHOD OF ILLUSTRATING UNIFORM ACCELERATION.

THE following method of illustrating in the presence of a class (or as a simple laboratory exercise) the principle of uniformly accelerated motion exceeds in simplicity, accuracy and interest any that I have hitherto found.

A ball rolling down a groove in an inclined plank and at the same time vibrating across the groove has a constant acceleration in one direction, while its transverse vibrations are pendular motions that mark the time. If the groove be painted black and well polished, lycopodium dusted on the groove will preserve a very sharp trace of the motion of the ball. When the powder has been blown off by a wave of a fan the trace comes out with the distinctness of a sharp chalk line. The distances traversed in successive vibrations of the ball are measured along a white thread stretched accurately in the middle of the groove (or along a white paint line). The two motions should start simultaneously in the middle of the groove; this may be secured by allowing the ball to roll initially along a transverse brass strip extending to the middle of the groove.

The frictional resistance to the motion of the ball is negligible and the constancy of the ratio of linear distance to square of number of vibrations depends only on the accuracy of the measurements and the straightness of the plank.

To illustrate the principle of constant acceleration the actual period of vibration of the ball is not required; but it may be found by observation or by timing a short pendulum that vibrates in unison with the ball. The linear acceleration of the ball can readily be shown to be  $5/7 g \sin$  (inclination of plank). The vibrating ball is a simple pendulum of length equal to the distance from the center of the ball to the center of curvature of the groove; but, to calculate the period,  $5/7 g$  must be used instead of  $g$ .

Several other points of interest may be noted. The record may be obtained by dusting the powder on the groove *after* the ball has rolled down. The record can only be completely removed by a damp cloth. The track of the ball on the powder is very curious and interesting, consisting of a ridge of powder with a clearing on each side. A very striking lecture experiment is to use fine sulphur powder instead of lycopodium; if the plank be raised to a vertical position, and brought down sharply on the table the record will appear instantaneously. If the plank be horizontal, the path of the ball will be a nearly perfect simple harmonic wave. If the grooved plank be placed on an inclined-plane plank, the coefficient of kinetic friction between the two may be deduced from two records, the first with the grooved plank held at rest, the second with the grooved plank in sliding motion.

I have found a groove five feet long, four inches wide and of four inches radius and a steel ball one and a half inches in diameter very satisfactory. The groove could be chipped out in a moment on a molding machine with knives of sufficient size; but, in the absence of such facilities, a number of longitudinal saw cuts of graduated depth, made by a circular saw, will render it easy to chisel the groove out by hand.

The International Instrument Co., of Cambridge, Mass., will supply the above apparatus on order.

A. WILMER DUFF.

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